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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,012	06/22/2005	Teruhiko Miyake	124284	1628
25944	7590	04/19/2007	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			TRAN, BINH Q	
			ART UNIT	PAPER NUMBER
			3748	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/19/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/540,012	MIYAKE ET AL.	
	<b>Examiner</b> BINH Q. TRAN	<b>Art Unit</b> 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 28 June 2006.
- 2a) This action is FINAL.      2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
- 4a). Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) 2-10 is/are allowed.
- 6) Claim(s) 1 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | Paper No(s)/Mail Date: _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date: _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

This office action is in response to the amendment filed June 08, 2006.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

***Claim 1 is rejected under 35 U.S.C. 102 (e) as being anticipated by Uedahira et al.***

***(Uedahira) (Patent Number 6,705,077).***

Regarding claim 1, Uedahira discloses NOx discharge quantity estimation method for an internal combustion engine (3) equipped with an EGR apparatus (9) for circulating to an intake

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passage of the engine a portion of exhaust gas flowing through an exhaust passage of the engine, characterized in that a quantity of NO<sub>x</sub> contained in exhaust gas discharged from the exhaust passage to the outside is estimated on the basis of a quantity of NO<sub>x</sub> generated in a combustion chamber as a result of combustion and a quantity of NO<sub>x</sub> circulated into the combustion chamber via the EGR apparatus (e.g. See Figs. 3-8; col. 9, lines 30-67; col. 10-12, lines 1-67; and col. 13, lines 1-20).

***Allowable Subject Matter***

Claims 2-10 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art fails to disclose or render obvious the claimed combination including the steps of estimating, as a combustion-generated NO<sub>x</sub> quantity, a quantity of NO<sub>x</sub> generated within the combustion region as a result of combustion, and an NO<sub>x</sub> quantity in a non-combustion region, the non-combustion region being the remaining region of the combustion chamber; and estimating, on the basis of the combustion-generated NO<sub>x</sub> quantity and the NO<sub>x</sub> quantity in the non-combustion region, a quantity of NO<sub>x</sub> contained in exhaust gas discharged from the exhaust passage to the outside.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

Applicant's arguments filed June 08, 2006 have been fully considered but they are not completely persuasive. Claims 1-10 are pending.

Applicants have argued that Uedahira does not teach or suggest Applicants's claimed invention. More specifically, Applicants assert that the reference to Uedahira fails to disclose the steps of *estimated on the basis of a quantity of NOx generated in a combustion chamber as a result of combustion and a quantity of NOx circulated into the combustion chamber via the EGR apparatus*. The examiner respectfully disagrees, in Figures 3-4 (**Steps 13-28**); and column 14, lines 46-67; and column 15, lines 1-26, Uedahira has clearly disclosed that “ *In the step S13, a NOx exhaust estimate FNOx is calculated by retrieval from a map, not shown, according to the engine rotational speed NE, the intake pipe absolute pressure PBA, and the preceding value LCMD0 of the target valve lift amount. The NOx exhaust estimate FNOx is indicative of the amount of NOx estimated to be exhausted from the engine 3 to the catalytic converter 8. The map is configured such that the NOx exhaust estimate FNOx becomes smaller as the preceding value LCMD0 is larger, and becomes larger as the engine rotational speed NE or the intake pipe absolute pressure PBA is larger.* ..... As described heretofore, according to the EGR control system 1 of the present embodiment, *the target valve lift amount LCMD is set such that the uneliminated NOx estimate MNOx, i.e. the amount of NOx estimated to remain uneliminated by the catalytic converter 8 is minimized, and the EGR control valve 10 is feedback-controlled such that the actual valve lift amount LACT becomes equal to the target valve lift amount LCMD*. In short, *the EGR rate is controlled such that the uneliminated NOx estimate MNOx is reduced. Thus,*

since the actual NOx-eliminating performance of the catalytic converter 8 is estimated at all times, and then the EGR rate is controlled based on the estimated NOx-eliminating performance. Therefore, differently from the prior art, the EGR control system 1 is capable of preventing NOx from flowing into the catalytic converter 8 at a flow rate far beyond the NOx-eliminating performance of the catalytic converter 8. This makes it possible to reduce the amount of NOx contained in exhaust gases treated by the catalytic converter 8, whereby exhaust emissions can be minimized. Further, since the uneliminated NOx estimate MNOx is calculated by using the NOx exhaust estimate FNOx calculated based on the engine rotational speed NE, the intake pipe absolute pressure PBA, and the target valve lift amount LCMD, and the estimated NOx elimination ratio RNOx calculated based on the estimated catalyst temperature TCT and the space velocity SV, it is possible to estimate the NOx-eliminating performance of the catalytic converter 8 properly according to the temperature of the catalytic converter 8 and the conditions of exhaust gases. ... Further, although in the embodiment, the target valve lift amount LCMD is calculated based on comparison using values of the amount of NOx estimated to remain uneliminated by the catalytic converter 8 (i.e. the uneliminated NOx estimate MNOx), this is not limitative, but the target valve lift amount LCMD may be calculated based on comparison using values of the amount of NOx (=FNOx.multidot.RNOx/100) estimated to be eliminated by the catalytic converter 8. It is clearly that Uedahira has show the steps of estimated on the basis of a quantity of NOx generated in a combustion chamber as a result of combustion and a quantity of NOx circulated into the combustion chamber via the EGR apparatus (the Valve Lift Amount LCMD) (Emphasis).

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THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Binh Tran whose telephone number is (571) 272-4865. The examiner can normally be reached on Monday-Friday from 8:00 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reached on (571) 272-4859. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Binh Q. Tran  
Patent Examiner  
Art Unit 3748

BT  
April 14, 2007